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ABSTRACT

A radio audience survey of 110 sample geographic clusters in the Santa Barbara, California, area served a twofold purpose: the construction of a demographic profile of audience types according to radio format choices, and the identification and analysis of various audience subgroups. A skip interval technique of these geographic clusters resulted in 523 in-home interviews where participants were asked their preferences of six radio formats: top forty, beautiful music, middle of the road (light rock, ballads, and news), live progressive rock, automated rock, and all news. Format choices were then analyzed according to the demographic variables sex, age, marital status, education, geographic stability, dwelling type, and residence ownership. Results indicated that persuaders and informers who use radio can use demographic distinctness to select an appropriate format for the target audience and stations with distinct audiences can predict that their programming is reaching a selected subgroup, that many subjects who named a top forty station as their favorite were past their teenage years, that nearly half of those with a four year college education indicated a preference for beautiful music and news, and that listeners of rock stations were more likely to call the station. (HAI)

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AUDIENCES FOR CONTEMPORARY RADIO FORMATS

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Analyses of radio listenership conducted by commercial agencies typically consider only the most rudimentary demographics. Radio's advertising clients traditionally have been primarily concerned with this basic information. But as radio has become more specialized in middle-sized and major markets, there has developed a need for more telling probes into the nature of the diversified audience.

There are several recent scholarly investigations in this area. Samuelson, Carter and Ruggels gathered data which challenged the previously-held belief that highly educated people do not use broadcast media as much as their less educated peers.¹ Their survey of 260 California males revealed that when the time reported as spent with media was adjusted for vocational role involvement, there remained a positive correlation between education and media use, including radio. The amount of time spent with radio was greatest among respondents who had completed high school or attended some college.

A later study by Bogart supported the "high school peak" notion for the education level of radio listeners, at least for white audience members.² This study also revealed that radio listening declined significantly among adults over 50 years old. Older teenagers have been found to listen to radio more than younger teens, and, at this age, girls listened more than boys.³ Further, at least 15 percent of the entire radio audience is composed of teenage listeners.⁴ Greenberg and Dominick have shown that white children listen

to the radio more than do black children.⁵

In recent years, some researchers have attempted to describe and explain media habits more fully by including personality, life-style, and communication variables as independent and dependent measures in their research designs.

Plummer, for instance, identified subjects who fit the criteria for his "achiever" category as the heaviest radio listeners.⁶ Massey found that a measure of "individualism" combined with certain demographics helped explain preferences for certain radio stations.⁷ Ruffner factor analyzed female progressive rock radio listeners and found them to cohere in patterns of listenership around specific functions which the medium provides.⁸ Similarly, Troidahl and Skolnik discovered six factors which accounted for much of the variance with respect to the meanings which radio holds for its audience members.⁹

Unfortunately, most of these studies regard the radio audience as a homogeneous group. However, since radio listeners select from a wide range of program formats, a detailed study of the medium's various subaudiences is in order. The present research is a descriptive analysis of the particular audiences of radio formats. In order to gather information about the radio preferences and habits of audience members, an extensive survey of a media market was undertaken in Santa Barbara, California, where seven radio stations originate their signals to serve about 200,000 persons. However, due to the close proximity of Los Angeles and other southern California communities, several other stations are clearly audible in the market. The number of stations which can be received is more than 20, representing the range of popular contemporary radio formats.

The intent of this research is to first use information given by listeners in order to construct a demographic profile of audience types by radio format. Then, by using multiple discriminate analysis, a compact multivariate method, we shall demonstrate the relative power of several important demographic variables in separating the audience subgroups. Finally, we will show the

comparative demographic uniqueness of audiences for several radio formats and the relationships which exist among these subaudiences. Our concern is not to document the characteristics of radio listeners in general, but to furnish a comparative analysis of listeners who indicate preferences for the stations. In order to do this, subjects' verbalized preferences for radio stations which are received in Santa Barbara have been condensed into groups which represent six common contemporary formats. The major formats which characterize this, and most radio markets, are:¹⁰

Top Forty. Stations which play the nation's most popular records and orient their air sound to the younger demographics. Short songs and excited disc jockeys characterize the format.

Beautiful Music. Easy listening, background music stations which feature popular ballads and lush instrumentals. Little or no news is presented.

Middle of the Road. Stations which play the light rock and roll songs, ballads, "oldies," and feature news, public affairs.

Live Progressive Rock. Stations which feature extended play album selections, music sets, and live announcing by the disc jockeys. Music varies from blues, jazz, folk, to hard rock and roll.

Automated Rock. Stations which play extended tracks from rock and roll albums but do not feature live announcers. Music back-announced on pre-recorded tape. Little news or public affairs is presented.

All News. Stations which report news, sports, weather. No music is presented.

Method

Randomly sampled geographic clusters were drawn in the population area from census tract data supplied by the Santa Barbara Planning Commission. From the master list of census tracts in the listening area, 110 sample clusters were selected using the skip interval technique.¹¹ These clusters each represented one city block in the communities which comprised the population of interest. Five households were contacted in each cluster, and one member of the household was interviewed in each dwelling. The projected sample size

(550) provided more than sufficient precision for purposes of this survey (5% tolerated error in 98 samples in 100). This degree of precision exceeds the sampling demands made by commercial research agencies, Pulse and Arbitron, for the Santa Barbara market. When incomplete questionnaires were later eliminated from the sample, the number of interviews analyzed was 523. Nearly equal numbers of men and women were interviewed.

Interviewers were graduate and undergraduate communication students at the University of California, Santa Barbara, who were trained by the researchers. Each in-home interview lasted approximately 45 minutes during which time 98 questions were asked of each respondent. This paper is limited to a discussion of a subset of these variables.

Results

Demographics

A brief description of the findings for the various demographic indices is presented below. The reader should consult Table I for complete documentation of the percentages for each radio format.

Sex: Two radio formats emerge with particular appeal to one sex more than the other. Top Forty stations have many more females among their listeners

Table I about here

than males and Live Progressive Rock stations have many more male listeners than female. To a lesser degree, males outnumber females among listeners of Automated Rock stations. Other formats have nearly equal attraction to men and women.

Age: This variable reveals contrasting concentrations of listeners among various age groupings. The Live Progressive format counts nearly 80% of its audience in the 18-34 range, with more than one-third of its listeners reported

to be from 25-34 years old. The Automated Rock format has a strong concentration of its listeners (nearly 60%) in the narrow range of 18-24 years. The Middle of the Road format has no particular concentration of listeners in any age group. The majority of listeners for the Beautiful Music format range in age from 35-65, while the All News listeners are a little older. Teenagers comprise about one-third of the total audience for Top Forty stations.

Marital Status: This variable is a good predictor of format preference. Clearly, radio listeners most likely to be married are those who prefer All News or Beautiful Music radio formats. Least likely to be married are Automated Rock or Live Progressive Rock listeners.

Education: Clear differences show up here too. High education is a characteristic of the Beautiful Music, Live Progressive Rock and All News formats.

Geographic Stability: Listeners of the All News format are by far the most geographically stable given that this concept can be defined as whether or not a change of residence has been made by the subject during the past two years. Listeners of Beautiful Music, Top Forty and Middle of the Road stations are also comparatively stable. The young adult audiences of the Live Progressive Rock and Automated Rock stations are least likely to have remained in one location for the two year period which preceded the collection of data.

Dwelling Type: Again, All News listeners emerge at the extrema. Top Forty listeners were also very likely to live in a house. Live Progressive Rock and Automated Rock listeners were least likely to live in a house.

Residence Ownership: The similarity among All News listeners and Beautiful Music listeners is true of this variable too. They are the most likely to own their own places of residence. Live Progressive Rock listeners were least likely to own.

Telephoning the Station: When asked if they had telephoned their favorite radio station during the past year (a measure of audience participation in the station's activities), most respondents said that they had not. Least likely to call the station for any reason were listeners of Beautiful Music, All News, and Middle of the Road stations. The most frequent station callers were listeners of the Live Progressive Rock format. Even Top Forty stations were not as likely as the Live Progressive Rock stations to receive phone calls from many of their listeners.

Newspaper Subscription: All News and Beautiful Music listeners were most likely to subscribe to a daily newspaper, Live Progressive Rock listeners were least likely to do so, with the other formats ranging between these extremes. Additional analysis of newspaper readership patterns indicated that about four-fifths of the Beautiful Music and All News listeners read a newspaper seven days a week, while only one third of the Live Progressive Rock listeners do so.

Magazine Subscription: Beautiful Music, All News, and Middle of the Road listeners were the most frequent subscribers to magazines. About half the sample in each of the other formats reported that they subscribe to at least one magazine.

Multiple Discriminant Analysis

The percentages reported in the previous section provide a reference for identifying the distinguishing characteristics of listeners of various radio formats. But it is also of interest to learn which demographic indices provide the most information in differentiating types of listeners for the formats. Further, how demographically unique is the audience for each format? These are empirical issues which can be addressed with multiple discriminant analysis.¹²

With this approach, audience subgroup membership is predicted for each subject after examination of all the relevant input data. Subgroup means, variances, and covariances are used first to develop a priori demographic profiles for each radio format. This is accomplished by considering the array of demographic variables for all persons who can name a preferred radio station. Demographics considered in this study are sex, age, marital status, education, geographic stability, dwelling type and residence ownership. After the format profiles are created, individual subjects are considered for inclusion in each of the format categories. The subject is placed into the category which best matches his or her own demographic constitution. When the overall degree of accuracy in this placement is high, a distinct, demographically predictable audience group is identified. In this analysis the discriminant problem was to define six populations of individuals (the format preferences) as they are identified from seven demographic variables. The critical discriminating variables were thereby identified and the relative distinctness of each major format became known.¹³

The Discriminant Functions

Two significant discriminant functions emerged (Table II). Each is characterized by a particularly powerful demographic variable. The most meaningful format discrimination was made with age as the primary component. To a far

Table II about here

lesser degree, residence ownership, geographic stability, and marital status contributed information to the first function. The second function was somewhat more ambiguous. Education was the major discriminating variable here, with geographic stability, dwelling type, sex, and age of secondary importance in separating the groups on this function. While three other functions were identified, the first two functions combined to account for more than 97 percent of the inter-group variability.

More information can be gained by examining the group centroids of discriminant scores for the demographic variables (Table III). In this way it is possible to determine how the demographic indices interacted with the format groups in order to separate the groups. Function 1 (age dominant) has been identified as an effective discriminating demographic matrix. Information pertinent to this function which was supplied by listeners of All News and

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 Table III about here  
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Beautiful Music radio formats contributed most to the effectiveness of the discrimination. Automated Rock, Live Progressive Rock, and Middle of the Road listeners also contributed meaningfully. Function 2 (education dominant) gained most information from examination of listeners of the Top Forty and Live Progressive Rock formats. Coefficients which represent the contributions made by each format on each of the two significant discriminant functions are plotted in Figure I. It is clear that knowledge of age for All News and Beautiful Music stations in particular contributed to an effective discrimination on the first

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 Figure I about here.  
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function. Similarly, knowledge of education for Top Forty and Live Progressive Rock listeners greatly increased the discriminating power of the second function.

Confusion Matrix of Format Preferences

The confusion matrix is an index of uniqueness for identified audience groups. It is a method for determining the demographic distinctness of audiences for each of the formats in the analysis. Further, it provides a measure of distance between each format group.

A normalized confusion matrix for the seven-variate, six-way discriminant run for the sample is provided in Table IV. Scores which appear on the main diagonal

of the matrix indicate correct classifications when a priori categories are matched with the demographic characteristics of individual subjects. Off-diagonal row entries represent incorrect classifications. Therefore, Table IV presents the probability for each format that an individual who is actually in the format's audience will be so classified when the demographics of the individual are compared with the known audience characteristics of listeners of the format.

Format Profiles

Three formats emerge with demographically distinct audiences. The most

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Table IV about here  
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distinct audience is that for the All News format. Live Progressive Rock format listeners also comprise a demographically predictable audience. The other relatively distinct audience is that group of listeners who stated a preference for the Top Forty format. The Beautiful Music format, Middle of the Road format, and Automated Rock format have less demographically predictable audiences.

We can also determine the reciprocity of the relationships between various audience subgroups (Figure II). We can discover if members of any

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Figure II about here  
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particular group are misclassified in a way whereby members of the second group are reciprocally misclassified into the first group. This is, of course, an index of comparative subgroup audience similarity. The arrows in Figure II indicate the direction of misclassification for the two largest off-diagonals in each row of Table IV. The figure indicates that Live Progressive Rock and Automated Rock audience misclassifications are reciprocal. Top

Forty and Automated Rock audiences are also misclassified reciprocally as are listeners of the Beautiful Music and All News Formats. Relationships among other formats are not so clear.¹⁴

Discussion

The amount of demographic distinctness or uniqueness obtained by radio formats has implications for persuaders and informers who use radio to reach their intended audiences. The highly distinct audience groups (All News, Live Progressive Rock, Top Forty) are more efficient in the dissemination of information to specific "target" audiences. Advertisers and the creators of public service messages can use this knowledge when they select among the various formats for transmission of their messages. Of course, when the appeal is a general one, exclusive use of a highly distinct format should perhaps be avoided.

Demographic distinctness is an important consideration for radio programmers too. Stations with distinct audiences may be assured that their programming is reaching a selected demographic subgroup. This is likely to be a desirable situation in large markets. In smaller markets, however, the programmer may desire to broaden the demographic base in order to increase overall audience size. The desirability of format distinctness, therefore, is affected by market size and the number of competing stations with the same format operating in the listening area. As demonstrated in this research, the fundamental demographic criteria for determining format distinctness are age and education.

A major objective of this research was to generate a more elaborate and exact description of audience characteristics of contemporary radio formats than was previously available. Many traditional beliefs of the nature of radio's subaudiences were confirmed and made precise in this study. Some

less intuitive findings, however, were also apparent.

For instance, the stereotype that Top Forty listeners are mainly teenagers was not supported by the data. Most subjects who named a Top Forty station as their favorite were past their teenage years. Nearly half of them were married and more than half owned their homes. Apparently, many of today's Top Forty listeners are young adults who were exposed to this format during their teenage years and have maintained interest in the type of music played by these stations and the manner in which it is presented. Very few Top Forty audience members were highly educated, so listeners of this format appear to be mainly working class young adults.

Interesting differences surfaced when the formats which attract the better educated listeners were examined. Nearly half of the subjects who said they preferred a Beautiful Music format station reported that they had at least a four-year college education. Beautiful Music stations air what can best be described as background music. These stations are not information oriented. Beautiful Music listeners apparently receive their news and information elsewhere and employ radio for background listening purposes.¹⁵ Another format with a high concentration of college graduates among its listeners is All News. Contrary to Beautiful music stations, programming on this format suggests that these listeners specifically use radio for information. The other format with a high education level is Live Progressive Rock, stations which typically attempt to involve their listeners in political, environmental, and socio-entertainment issues and activities. They often broadcast "alternative" news and public affairs programming.

Listeners of these three formats are also at the extremes on the measure of audience-station interaction. Beautiful Music and All News listeners were extremely unlikely to call their favorite stations for any

reason. Of course, these listeners are older than those for other formats. But the type of programming transmitted by Beautiful Music and All News stations may also contribute to the phenomenon. Beautiful Music stations present a "wall of music" whereby an unobtrusive stream of melodies is presented in an impersonal fashion. Similarly, All News stations broadcast a "wall of information" each day. Predictability of program content and style of presentation may create a sense of distance between the sources and receivers of these programs and messages. Live Progressive Rock stations have the most active listeners by this measure. Many of these stations serve as a kind of "community switchboard" for the young adult community where they broadcast. The informal style of these stations may also encourage listeners to call the disc jockey.

While this study was conducted in a single location, the formats which are considered can be found in most fairly large media markets in the country. Although geographic differences are likely to reflect some dissimilarities in the types of audience members who listen to the various formats, there is no reason to believe that the essential demographic profiles and analyses presented here misrepresent patterns of radio listenership in other cities. Temporal differences are more likely to interfere with the validity of these data. Although comparable historical data does not exist and therefore inhibits direct comparison, listeners to some of the contemporary radio formats are not likely to closely resemble the format's demographic constitution ten or fifteen years ago. Radio formats appear and disappear with changes in music and other cultural influences. Some cohorts of listeners apparently settle on a format preference and continue to listen as they grow older. There is, therefore, good reason to predict that the demographic status of radio listeners will be redistributed in the future. The dynamic nature of the medium requires periodic assessment and analysis of its many audiences.

Notes

¹Merrill Samuelson, Richard F. Carter and Lee Ruggels, "Education, Available Time, and Use of Mass Media," Journalism Quarterly 40: 491-496 (Autumn, 1963).

²Leo Bogart, "Negro and White Media Exposure: New Evidence," Journalism Quarterly 49: 15-21 (Spring 1972).

³Edward Papazian, "Teenagers...and Broadcast Media," Media/Scope 11: 109-115 (Dec. 1967).

⁴Neal T. Weintraub, "Some Meanings Radio Has For Teenagers," Journal of Broadcasting 15: 147-152 (Spring 1971).

⁵Bradley S. Greenberg and Joseph R. Dominick, "Racial and Social Class Differences in Teen-Agers Use of Television," Journal of Broadcasting 13: 331-344 (Fall 1969).

⁶Joseph T. Plummer, "Life Style Patterns: A New Constraint for Mass Communications Research," Journal of Broadcasting 16: 79-89 (Winter 1971-72).

⁷William F. Massy, "Discriminant Analysis of Audience Characteristics," Journal of Advertising Research 5: 39-48 (1965).

⁸Marguerite Anne Ruffner, "Women's Attitudes Toward Progressive Rock Radio," Journal of Broadcasting 17: 85-94 (Winter, 1972-73).

⁹Verling C. Troidahl and Roger Skolnick, "The Meanings People Have for Radio Today," Journal of Broadcasting 12: 57-67 (Winter 1967-68).

¹⁰Some respondents mentioned stations which represent formats such as Country-Western, Soul, Jazz, Classical, and Spanish-speaking. None of these categories attained a sample size of 20, however, the criterion for entry into the analysis.

¹¹See Charles H. Backstrom and Gerald D. Hursh, Survey Research (Evanston, Illinois: Northwestern University Press, 1963).

¹²There are many advantages to multiple discriminant analysis (MDA) and the resulting confusion matrix for research problems like the one considered in this paper. Any indices which can be quantified, even nominally, can be used as input audience profile data. Because MDA is a multivariate statistical technique, interrelationships between explanatory variables are taken into account statistically, the same as in multiple regression. Finally, reporting of the discriminant function coefficients, group centroids for criterion variables, and the confusion matrix can be done in a compact manner which facilitates easy interpretation. For an excellent introduction to this method, see William F. Massy, "Discriminant Analysis of Audience Characteristics," Journal of Advertising Research 5: 39-48 (1965).

¹³In order to solve the discriminant problem, the variables must be approximately normally distributed in each population, their respective variance and covariance matrices must be about equal, and a priori probabilities for membership in each format group must be known. Typical statistical packages, such as SPSS, provide methods for satisfying this assumption when a priori probabilities are known to be unequal. In this study, equal a priori probabilities were assumed for group membership in any of the six format preference groups. Since some audience members could not state a preference, or selected a station which did not fit within the parameters of the formats considered, the sample size was reduced to 414.

¹⁴Only one arrow originates from the All News format since there was a three-way tie for second closest association with this audience group.

¹⁵This seems evident by their high rate of subscription to newspapers and magazines. See Table I.

TABLE I

Radio Format Preference by Demographic Indices^a

FORMAT PREFERENCE	SEX		AGE						MARITAL		
	Male	Female	12-17	18-24	25-34	35-49	50-64	64+	Married	Single	Other
TOP FORTY (n = 99)	38	62	34	18	24	10	10	5	43	54	3
BEAUTIFUL MUSIC (n = 80)	54	46	1	1	18	25	36	19	72	21	7
MIDDLE ROAD (n = 53)	50	50	7	19	17	15	17	24	51	38	11
LIVE PROG ROCK (n = 112)	59	41	12	43	35	9	0	0	29	69	2
AUTOMATED ROCK (n = 45)	56	44	13	58	18	2	4	4	24	64	11
ALL NEWS (n = 25)	50	50	0	8	12	12	0	31	73	23	4

N = 414

^a Cell entries are percentages which have been rounded to nearest one percent.

TABLE I (Cont'd)

Radio Format Preference by Demographic Indices

FORMAT PREFERENCE	EDUCATION							MOVED		DWELLING		PHONE STATION	
	8th	some high	high	some coll	coll grad	some grad	adv deg	Yes	No	House	Apartment	Yes	No
TOP FORTY (n = 99)	20	20	28	24	3	2	3	32	69	85	15	28	72
BEAUTIFUL MUSIC (n = 80)	3	4	18	29	25	15	8	26	74	79	20	10	90
MIDDLE ROAD (n = 53)	9	7	20	43	6	37	9	37	63	71	29	8	91
LIVE PROG ROCK (n = 112)	3	10	10	45	19	7	5	71	29	51	48	41	59
AUTOMATED ROCK (n = 45)	4	17	20	42	7	9	0	60	40	50	50	27	73
ALL NEWS (n = 25)	0	12	19	42	8	12	8	12	89	91	9	8	92

TABLE I (Cont'd)

Radio Format Preference by Demographic Indices

FORMAT PREFERENCE	RESIDENCE			NEWSPAPER		MAGAZINE	
	own	rent	live w/ family	yes	no	yes	no
TOP FORTY (n = 99)	62	21	17	66	34	55	45
BEAUTIFUL MUSIC (n = 80)	73	24	3	88	12	81	19
MIDDLE ROAD (n = 53)	54	39	8	74	26	67	33
LIVE PROG ROCK (n = 112)	22	69	9	47	52	50	50
AUTOMATED ROCK (n = 45)	31	58	9	59	41	49	50
ALL NEWS (n = 25)	56	20	4	80	19	80	20

Table II

Standardized Discriminant Function Coefficients

DEMOGRAPHIC VARIABLE	FUNCTION 1	FUNCTION 2
SEX	-.01	-.24
AGE	.83	.20
MARITAL STATUS	-.14	.08
EDUCATION	.07	.64
GEO STABILITY	.17	-.28
DWELLING TYPE	-.03	.27
RESIDENT OWNERSHIP	.19	-.16
eigenvalue	.64	.25
canonical correlation	.62	.45
chi-square	285.8	96.53
df	35	24
p>	.001	.001

Table III

Format Group Centroids

FORMAT-TYPE	FUNCTION 1 (AGE DOMINANT)	FUNCTION 2 (EDUCATION DOMINANT)
TOP FORTY	-.21	-.75
BEAUTIFUL MUSIC	.85	.25
MIDDLE OF THE ROAD	.46	.04
LIVE PROGRESSIVE ROCK	-.59	.44
AUTOMATED ROCK	-.62	.07
ALL NEWS	1.14	.07

Figure 1
Radio Format Placement of Age and Education
Dominant Discriminant Functions

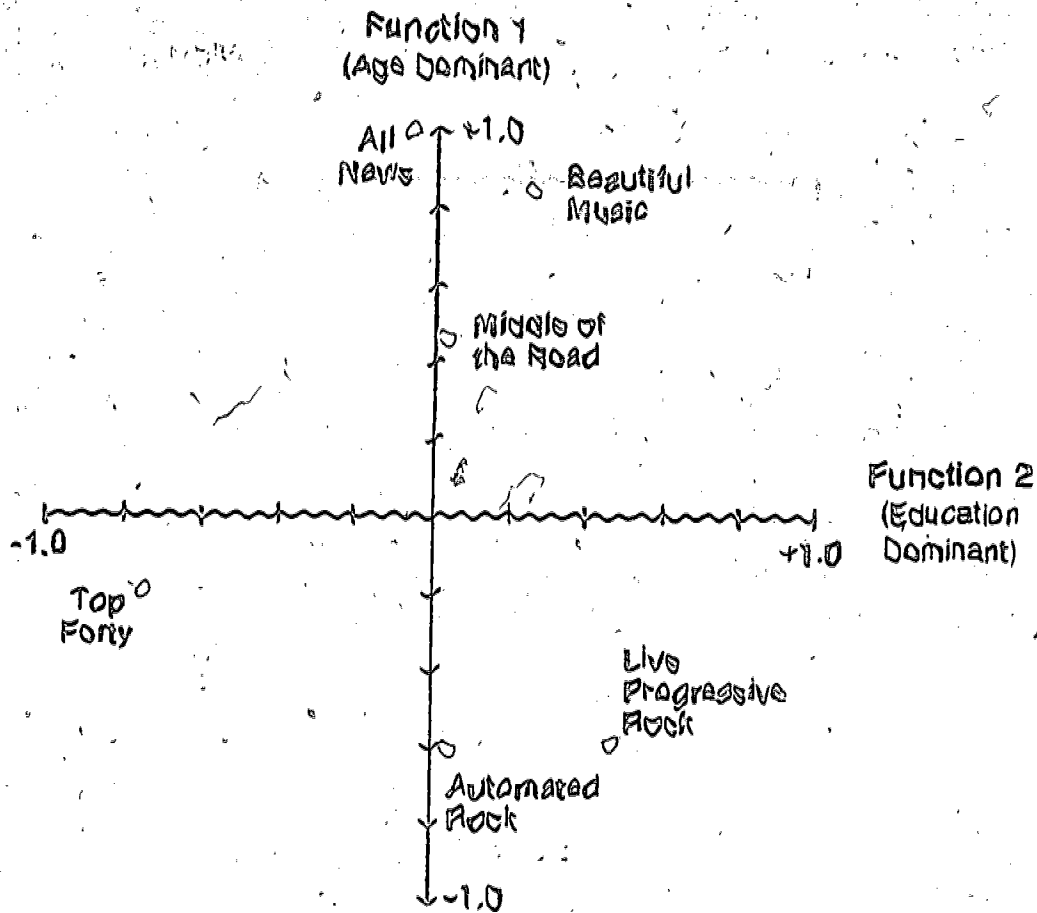


TABLE IV

Normalised Confusion Matrix for Seven Variables
Assuming Equal Probabilities^a

Actual Group Membership	n of cases	Predicted Group Membership					
		Top Forty	Beautiful Music	Middle of The Road	Live Pro- gressive Rock	Automated Rock	All News
TOP FORTY	101	54%	7%	4%	9%	10%	17%
BEAUTIFUL MUSIC	81	3%	21%	16%	15%	3%	43%
MIDDLE OF THE ROAD	52	17%	15%	14%	21%	2%	31%
LIVE PROGRESSIVE ROCK	114	18%	7%	2%	60%	11%	4%
AUTOMATED ROCK	45	24%	0%	4%	44%	20%	7%
ALL NEWS	26	8%	12%	8%	8%	4%	62%
ALL PREFERENCE	104						

N = 523 Percent of grouped cases currently classified: 40.81%

^a Percentages rounded to nearest one percent.

Figure II
Audience Format Reciprocity

